DOCUMENT RESUME

ED 222 237 PS 013 003

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TITLE Circumplex and Spherical Models for Child School Adjustment and Competence.
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SPONS AGENCY National Inst. of Child Health and Human Development (NIH), Bethesda, Md.
PUB DATE Aug 82
GRANT NICHHD-HD-09130-03
NOTE 22p.; Paper presented at the Annual Meeting of the American Psychological Association (90th, Washington, DC, August 23-27, 1982).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Adjustment (to Environment); Classroom Research; *Competence; Creativity; Curiosity; *Factor Structure; Hostility; Intelligence; *Kindergarten Children; Models; Primary Education; Prosocial Behavior; Rating Scales; *Statistical Analysis; *Student Behavior
IDENTIFIERS Circumplex Models (Statistics); Classroom Behavior Inventory (Schaefer et al); Distractibility; Extraversion Introversion; Order Relations; Task Orientation

ABSTRACT

The goal of this study is to broaden the scope of a conceptual model for child behavior by analyzing constructs relevant to cognition, conation, and affect. Two samples were drawn from school populations. For the first sample, 28 teachers from 8 rural, suburban, and urban schools rated 193 kindergarten children. Each teacher rated up to eight children, half of whom were white, half black. In the second sample, 12 kindergarten teachers from the 6 schools of a small urban community rated the 293 children in their classrooms, using the Classroom Behavior Inventory. Scales measuring the two major dimensions of the circumplex model for social and emotional behavior were supplemented with scales measuring conation/motivation and cognition. Factor analyses of scale scores for the two samples (including a principal factor analysis and varimax rotation) identified major dimensions of classroom behavior. Scales and factors were arranged according to Guttman's order of neighboring. A three-dimensional model was generated with plots of the factor loadings, and a generalized model was developed which integrated previous research on circumplex models. Results are discussed. (RH)

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Circumplex and Spherical Models for Child School Adjustment and Competence

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Presented at the American Psychological Association Annual Meeting

Washington, D.C.

August 23, 1982

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This research was supported by National Institute of Child Health and Human Development grant HD-09130-03.

Circumplex and Spherical Models for Child School Adjustment and Competence

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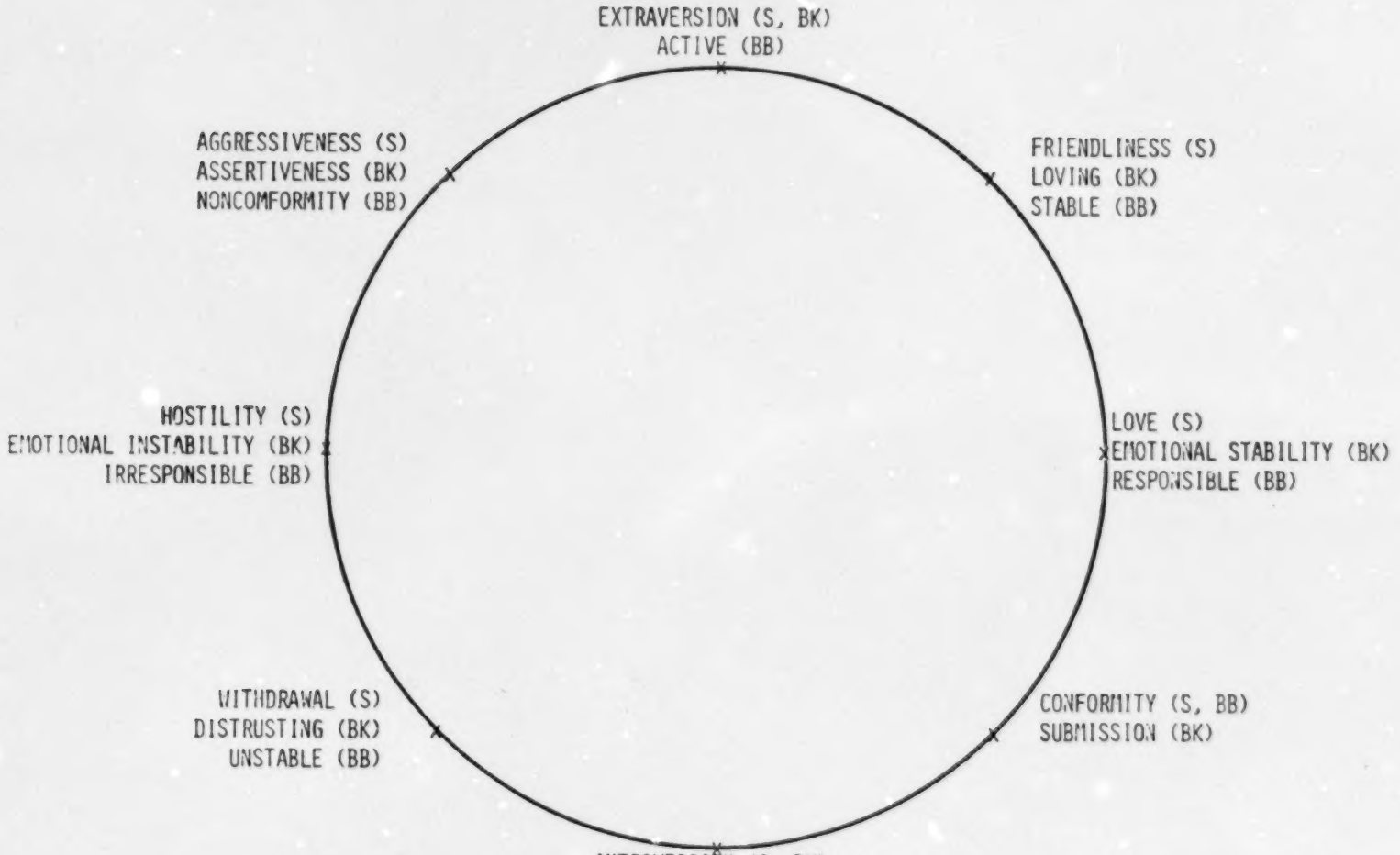
Although the many models for human behavior described in "Models of Man" (Chapman & Jones, 1980) and "Maps of the Mind" (Hampden-Turner, 1982) illustrate the search for parsimonious models, most conceptual models have not been derived from statistical analyses of empirical data. However, statistical methods have been developed that facilitate the development of conceptual frameworks from empirical research. The initial definition of the domain both limits the scope of the research and specifies relevant concepts. Scales are developed by writing specific behavior items that are to be summed to provide scores for behavior constructs. Although factor analysis is the major statistical method for isolating factors or dimensions for the domain, a list of independent factors does not provide an integrated model for a domain. Thurstone (1947) used factor loadings to develop spatial plots with a goal of identifying factors or dimensions rather than of generating conceptual configurations. Guttman's (1954) radex theory first proposed a circumplex ordering of concepts with a goal of identifying "an order of neighboring" among variables. Shepard (1962) proposed a mathematical "analysis of proximities" that has contributed to the many different methods for "spatial representations of structures in data" (Shepard, Romney, & Nerlove, 1972). Schaefer (1959, 1961) used two-dimensional organizations of data to develop generalized circumplex models for maternal behavior and for child behavior. The general circumplex models have been replicated by research on two-dimensional and circumplex models in research on parent behavior and child behavior (Schaefer, 1971, 1981). Three-dimensional configurational models for

maternal behavior were developed by Becker and Krug (1964) and Schaefer (1965) from more differentiated and extended analyses of parent behavior.

Circular models for social, emotional and interpersonal behavior were anticipated by Leary's (1957) Interpersonal Behavior Circle. Schaefer (1961) used Guttman's (1954) concepts of the circumplex and order of neighboring to develop a circumplex organization of teacher ratings of child behavior and to propose a general circumplex model for child behavior. Becker and Krug (1964) and Baumrind and Black (1967) organized additional empirical data and developed modified circumplex models for child behavior. An integration of the higher-level constructs of Schaefer (1961), Becker and Krug (1964) and Baumrind and Black (1967) that was proposed by Baumrind and Black (1967) is shown in modified form in Figure 1. Despite differences in higher level constructs that are proposed, the empirical data strongly support the equivalence of the empirical organizations and of the generalized circumplex models for child social and emotional behavior.

Research and reviews of two-dimensional, circumplex analyses of child social and emotional behavior (Benjamin, 1974; Schaefer, 1971, 1981) have provided additional replication of the model. The circumplex model has also integrated emotions, traits, and diagnostic constructs (Schaefer & Plutchik, 1966) and interpersonal behavior and traits (Conte & Plutchik, 1981; Lorr & McNair, 1963; Wiggins, 1979) of adults. These similar circumplex integrations of social, emotional, and interpersonal behavior and diagnostic constructs illustrate Warr's (1980, p. 291) comments about the strengths and limitations of scientific models: "Our conceptual moulds give shape to our thinking, establish systems of meaning, and create familiar patterns which we can manipulate and work with....The economy, guidelines, and objectives provided by these scientific perspectives are of clear benefit to an investigator, yet

Figure 1



INTEGRATION OF THREE CIRCUMPLEX MODELS BY SCHAEFER, 1961, (S); BECKER AND KRUG, 1964; (BK), AND BAUMRIND AND BLACK, 1967; (BB)

their negative aspects, limited focus and restricted notions of what is worth while, need always to be kept in mind." Therefore the goal of this research is to broaden the scope of a model for child behavior by analysis of constructs relevant to cognition/intelligence and conation/motivation, as well as affect/social-emotional behavior.

Method

Subjects. For Sample A, twenty-eight teachers from eight rural, suburban, and urban schools rated 193 kindergarten children. Each teacher rated up to eight children, half white and half black, in the spring of kindergarten. In sample B twelve kindergarten teachers from the six schools of a small urban community rated the 293 children in their classrooms.

Data collection method. The Classroom Behavior Inventory (Schaefer, 1971; Schaefer & Edgerton, 1977) was used to collect teacher ratings of child behavior in the classroom. Scales that measure the two major dimensions of the circumplex model for social and emotional behavior -- Extroversion versus Introversion, Considerateness versus Hostility -- were supplemented with scales for Task-Orientation, Distractibility and Curiosity/Creativity that measure conation/motivation, and for Verbal Intelligence that measures cognition. Scales and sample items are shown in Table 1 and Figure 2. The scales have shown high reliability and significant validity in predicting school adjustment and achievement (Kohn, 1977; Schaefer & Edgerton, 1979).

Factor analyses of scale scores for the two samples with a principal factor analysis and varimax rotation identified major dimensions of classroom behavior. Scales and factors were ordered according to Guttman's order of neighboring. A three-dimensional model was generated with plots of the factor loadings and a generalized model was developed that integrated previous research on circumplex models.

Table 1

CLASSROOM BEHAVIOR INVENTORY: SCALES, NUMBER OF ITEMS, INTERNAL CONSISTENCY RELIABILITY--ALPHA, AND SAMPLE ITEMS

HOSTILITY: 3 ITEMS, ALPHA = .87

RIDICULES AND MOCKS OTHERS WITHOUT REGARD FOR THEIR FEELINGS. TRIES TO GET EVEN WITH A CHILD WITH WHOM HE/SHE IS ANGRY.

CONSIDERATENESS: 5 ITEMS, ALPHA = .89

RESPECTS THE RIGHTS OF OTHER CHILDREN. IS AGREEABLE AND EASY TO GET ALONG WITH.

DISTRACTIBILITY: 3 ITEMS, ALPHA = .87

IS QUICKLY DISTRACTED BY EVENTS IN OR OUTSIDE THE CLASSROOM. OFTEN CANNOT ANSWER A QUESTION BECAUSE HIS/HER MIND HAS WANDERED.

TASK ORIENTATION: 5 ITEMS, ALPHA = .95

WORKS EARNESTLY, DOESN'T TAKE IT LIGHTLY. STAYS WITH A JOB UNTIL IT IS FINISHED, EVEN IF IT IS DIFFICULT FOR HIM/HER.

VERBAL INTELLIGENCE: 5 ITEMS, ALPHA = .96

HAS A GOOD FUND OF INFORMATION FOR A CHILD HIS/HER AGE. USES A LARGE AND VARIED VOCABULARY.

CREATIVITY/CURIOSITY: 5 ITEMS, ALPHA = .92

SAYS INTERESTING AND ORIGINAL THINGS. ASKS QUESTIONS THAT SHOW AN INTEREST IN IDEAS.

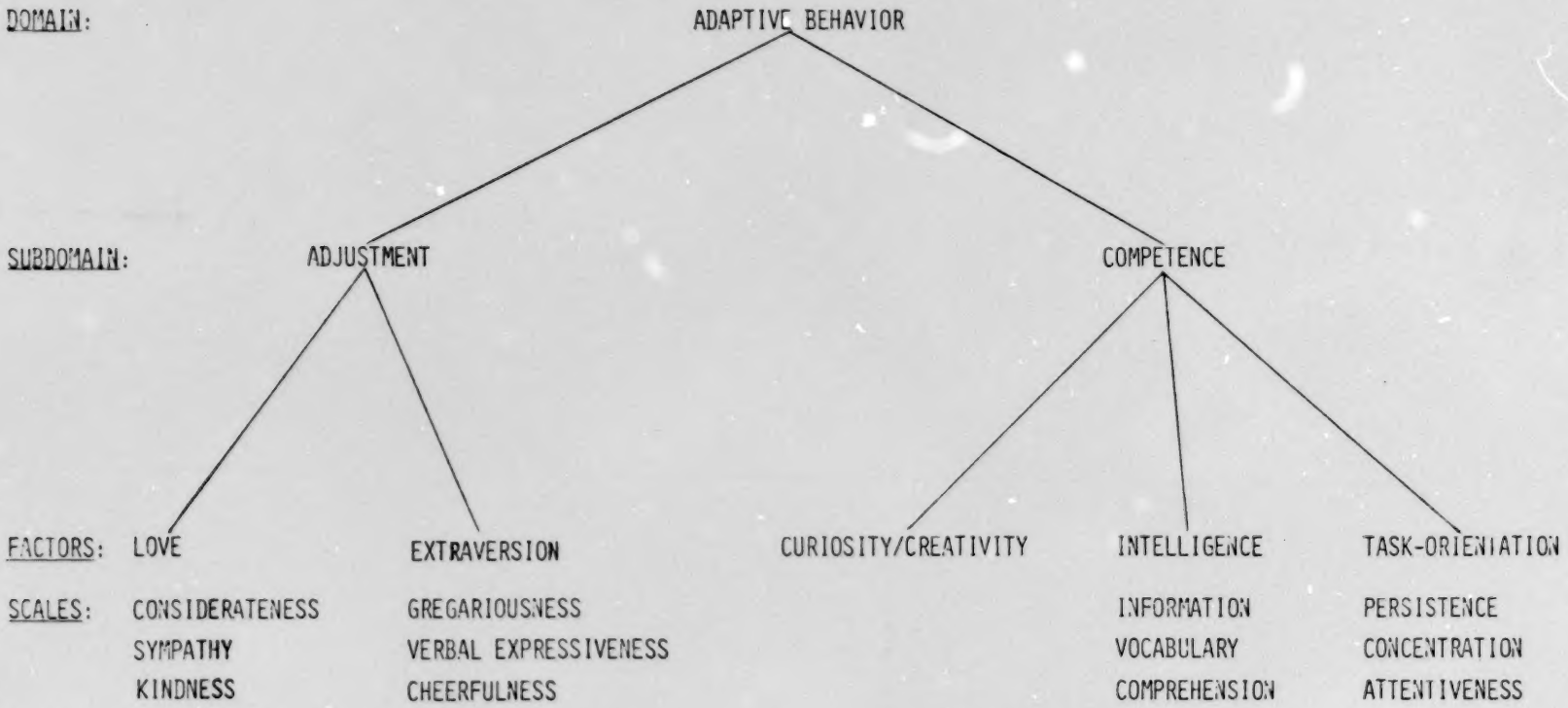
INTROVERSION: 3 ITEMS, ALPHA = .75

TENDS TO WITHDRAW AND ISOLATE HIMSELF/HERSELF, EVEN WHEN HE/SHE IS SUPPOSED TO BE WORKING IN A GROUP. IS USUALLY SAD, SOLEMN, AND SERIOUS LOOKING.

EXTRAVERSION: 5 ITEMS, ALPHA = .83

DOES NOT WAIT FOR OTHER CHILDREN TO APPROACH HIM/HER, BUT SEEKS THEM OUT. LAUGHS AND SMILES EASILY AND SPONTANEOUSLY IN CLASS.

FIGURE 2. A HIERARCHICAL MODEL FOR ADAPTIVE BEHAVIOR



Results

The three factors that were clearly replicated in Samples A and B include 74 percent of the total variance for Sample A, 79 percent of the total variance for Sample B, and more than 90 percent of the reliable scale variance for both samples. The varimax rotated factors are reported in Table 2 with the scales and factors organized by Guttman's (1954) order of neighboring. Dimensions of Extraversion versus Introversion and of Considerateness versus Hostility clearly replicate the two major dimensions of the circumplex model for social, emotional and interpersonal behavior. The scales that were developed to measure academic competence, including both ability and motivation, define a third factor with highest loadings for Verbal Intelligence and major loadings for Curiosity/Creativity and Task-Orientation. Task-Orientation and Distractibility also have significant loadings on the factor of Considerateness versus Hostility, while Curiosity/Creativity also has significant loadings on the factor of Extraversion versus Introversion. Spatial plots of the three dimensions generate a replicated three-dimensional spherical model for child competence and adjustment (Figure 3) that is integrated with the circumplex model for social and emotional behavior developed from Schaefer (1961), Becker and Krug (1964) and Baumrind and Black (1967) in Figure 4. A configurational model for the maladaptive behavior octant that suggests relationships to major diagnostic constructs for children is shown in Figure 5. Schaefer's (1981) theoretical integration of adaptive behavior, maladaptive behavior, and diagnostic constructs has been confirmed from teacher ratings of different diagnostic groups by McKinney and Forman (1982).

Table 2

FACTOR ANALYSES OF SCALES OF THE CLASSROOM BEHAVIOR INVENTORY

	FACTORS[1]					
	SAMPLE A N = 193			SAMPLE B N = 293		
SCALES	I	II	III	I	II	III
LOW HOSTILITY	89	05	02	90	-11	08
CONSIDERATENESS	83	23	07	78	32	12
LOW DISTRACTIBILITY	55	57	15	57	54	10
TASK-ORIENTATION	39	79	15	41	76	18
VERBAL INTELLIGENCE	14	84	33	15	82	21
CURIOSITY/CREATIVITY	-01	76	52	10	77	44
LOW INTROVERSION	-09	17	88	18	29	69
EXTRAVERSION	-05	39	82	05	21	94

[1]
I. CONSIDERATENESS VERSUS HOSTILITY
II. ACADEMIC COMPETENCE
III. EXTRAVERSION VERSUS INTROVERSION

Figure 3

A SPATIAL REPRESENTATION OF A SPHERICAL MODEL FOR ADAPTIVE BEHAVIOR

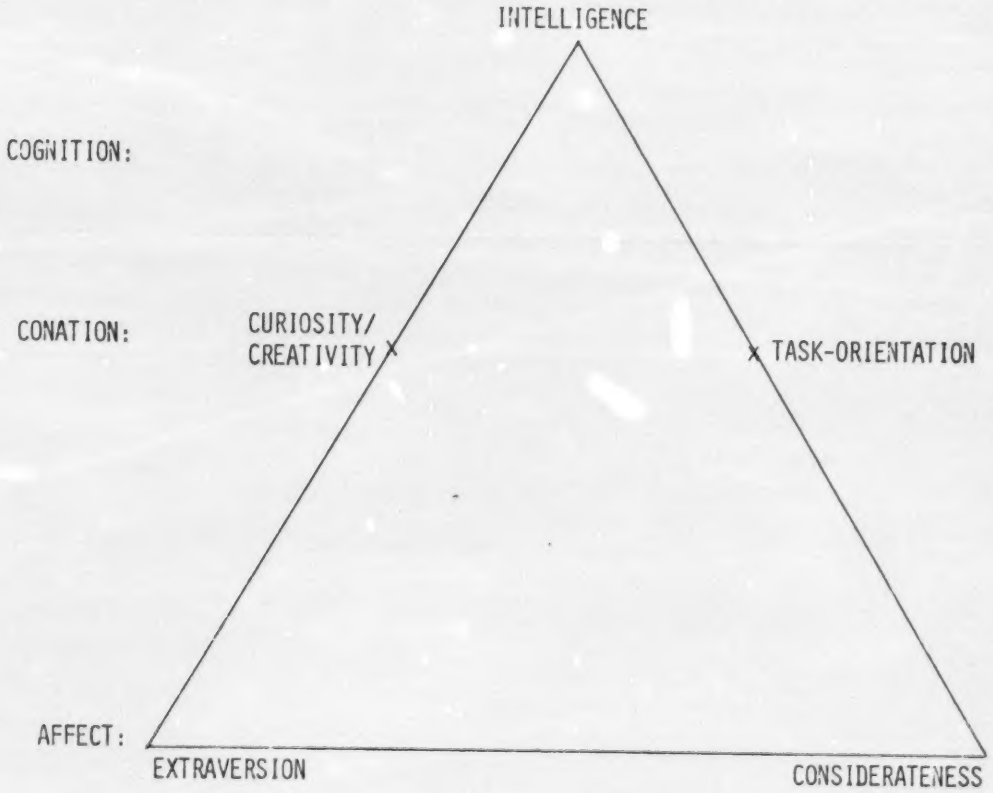
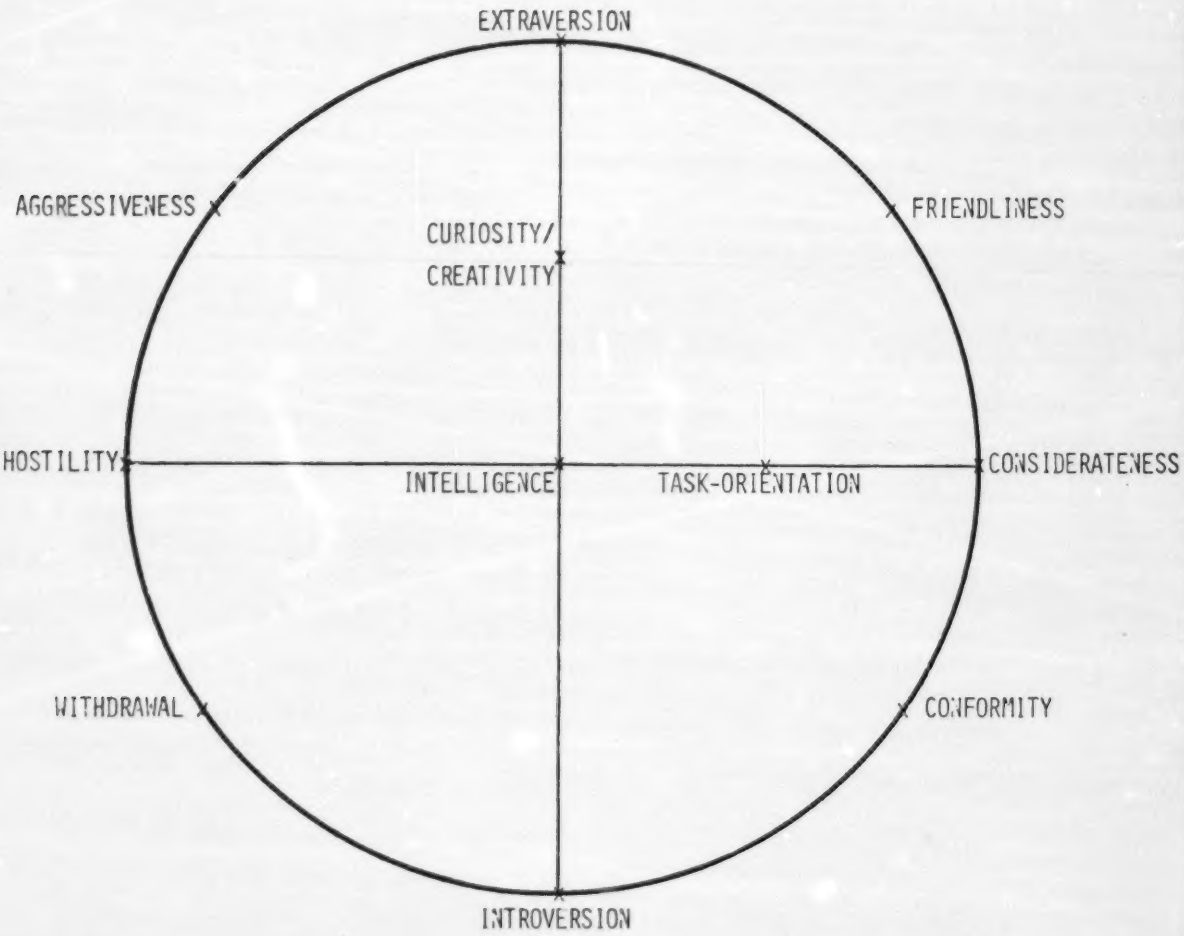
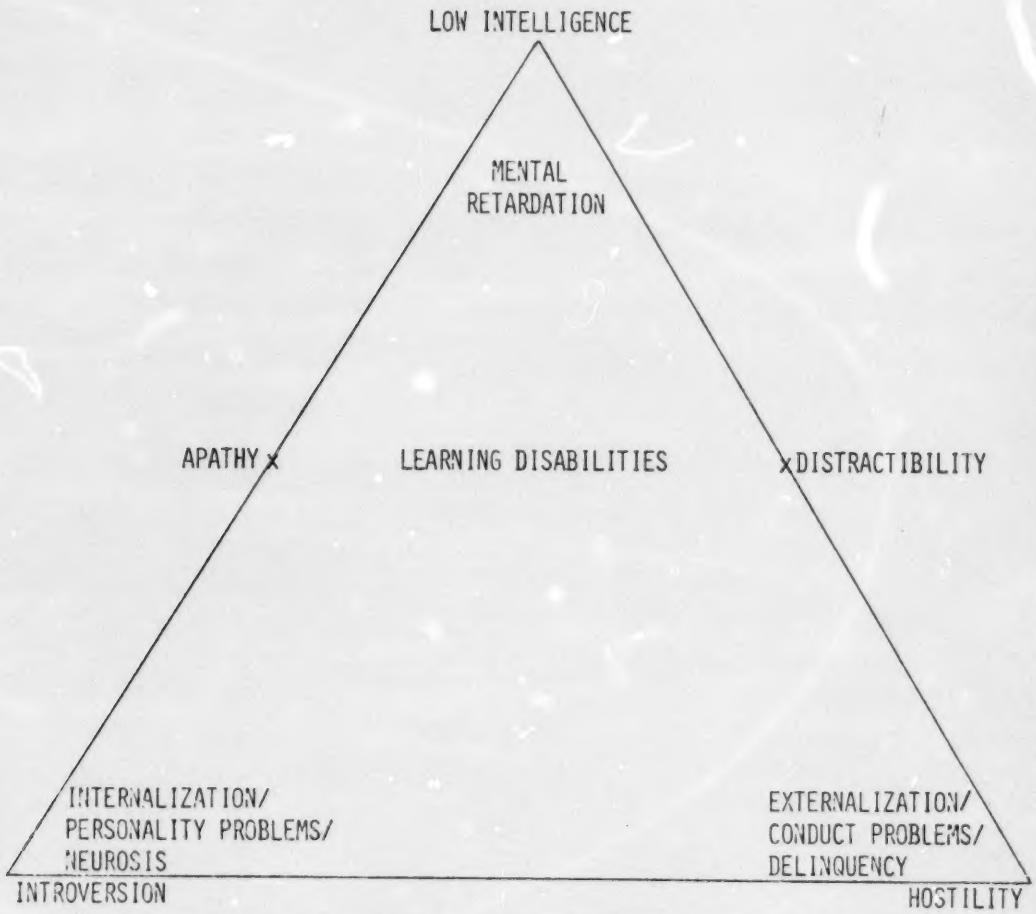


Figure 4



A TWO-DIMENSIONAL PROJECTION OF A SPHERICAL MODEL FOR ADAPTIVE BEHAVIOR

Figure 5



A CONFIGURATIONAL MODEL FOR MALADAPTIVE BEHAVIOR AND DIAGNOSTIC CONSTRUCTS

Discussion

The findings clearly replicate the two major dimensions of the circumplex model; replicate a third dimension of academic competence with loadings for Verbal Intelligence, Curiosity/Creativity, and Task-Orientation; and generate a spherical model for adjustment and competence. Generalization from the earlier research on the circumplex model suggest that the spherical model will provide a conceptual framework for integration of concepts and measures that describe affect/social and emotional behavior, conation/motivation, and cognition/intelligence in other settings and with other age groups.

Warr's (1980) parameters of conceptual frameworks provide a basis for examining characteristics of the method--The Classroom Behavior Inventory--and of the spherical model for adaptive behavior. The intended reference or domain of the spherical model includes both adjustment and competence. The spherical model provides both parsimony and internal consistency in the interrelationships of behavior concepts. The hierarchical ordering -- items, scales, factors, and configuration -- provide a high degree of elaboration of the model that has been confirmed and extended by other investigators (Becker and Krug, 1964; Baumrind and Black, 1967; Benjamin, 1974) using other concepts and other measures. The heuristic value of the model is that it may influence design and/or integration of other empirical and conceptual developments. The circumplex model has received, and the spherical model shows promise of receiving, additional actual and potential empirical research. Research methods and types of evidence have been specified by this study and earlier studies of configurational models. Those methods allow an adequate degree of quantification for empirical research on child behavior. Yet the method and model are compatible with other perspectives, e.g., time-sample observations

and experimental and test data on child behavior. Perhaps the beauty of the conceptual framework is its parsimony and generality as a model for research on child behavior. No causal assumptions are made since the model is a phenotypical rather than a genotypical description of child behavior. The major extra-scientific assumption is that raters can provide reliable and valid data for development of a general model for child behavior. Both reliability and validity of the components of the model have been and can be verified by empirical research. Perhaps interdependence with action can be established by utilizing the model in planning and designing clinical programs and in research and evaluation of interventions designed to influence the adaptive behavior -- adjustment and competence -- of children.

Conclusions

1. Hierarchical, dimensional, and configurational analyses are complementary methods for developing a conceptual framework for a defined domain.

2. The frequent replications of a two dimensional, circumplex model for social, emotional and interpersonal behavior provide a basis for an extended analysis of adaptive behavior -- adjustment and competence.

3. The Classroom Behavior Inventory provides a method for hierarchical, dimensional, and configurational analyses of teacher ratings of classroom behavior.

4. Factor analyses of teacher ratings of two large samples of kindergarten children have identified three replicated dimensions of extraversion versus introversion, considerateness versus hostility, and intelligence from scales of the Classroom Behavior Inventory.

5. Spatial plots of the three factors generate a spherical model for adaptive behavior.

6. The model integrates concepts for cognition/intelligence, conation/motivation, and affect/social and emotional behavior.

7. The model facilitates integration of adaptive behavior concepts with diagnostic constructs.

8. The Classroom Behavior Inventory method and the spherical model for adaptive behavior provide a basis for design and implementation of longitudinal research on child behavior in the classroom.

9. The spherical model provides a conceptual framework for integration of research on adaptive behavior -- adjustment and competence -- and psychopathology of children and adults.

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